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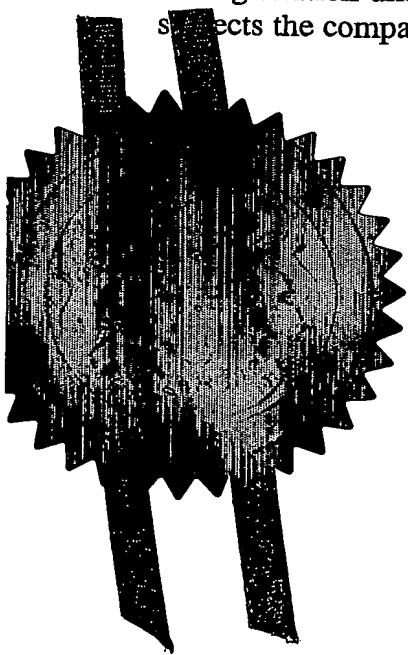
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HL82651/000/MRB

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0226747.4

15 NOV 2002

3. Full name, address and postcode of the or of each applicant (underline all surnames)

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If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

VEHICLE IMMOBILISATION DEVICE

5. Name of your agent (if you have one)

Haseltine Lake

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

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WC2B 6UD

Patents ADP number (if you know it)

34001

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Date

Haseltine Lake, Agents for the Applicants

Haseltine Lake

15 November 2002

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ADDITIONAL APPLICANT SHEET

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VEHICLE IMMOBILISATION DEVICE

The present invention relates to a vehicle immobilisation device.

5 Wheel clamp devices are in common use today for dealing with illegally parked vehicles. Such a wheel clamp device is attached to the wheel of an illegally parked vehicle by a wheel clamp operative so as to prevent the owner of the vehicle from driving the
10 vehicle away. At the same time as deploying the wheel clamp device on the illegally parked vehicle, the wheel clamp operative will usually display a notice in the window of the vehicle informing the owner that the vehicle is illegally parked and that the wheel clamp
15 device will remain on the vehicle until such a time as a penalty fee is paid. When the owner of the vehicle has contacted the authorities and paid the penalty fee, the wheel clamp operative is instructed to return to the vehicle to remove the wheel clamp device, after
20 which the owner of the vehicle is free to remove the vehicle.

One problem with such existing wheel clamp devices is that, in order to be effective in immobilising the vehicle as well as strong and secure enough to prevent
25 unauthorised removal of the device (by means of force or otherwise), they tend to be very bulky and heavy. Furthermore, the complexity of many such wheel clamp devices makes the successful and secure deployment very difficult to achieve for an inexperienced wheel clamp
30 operative. The wheel clamp operative can also be put at a great risk when deploying a wheel clamp device on a vehicle that is parked flush to an obstacle on one side (for example a kerb), forcing the operative to work in the flow of oncoming traffic on the exposed
35 side of the vehicle. Wheel clamp devices are also

often ineffective against large-wheeled vehicles such as trucks and buses.

It is therefore desirable to provide a vehicle immobilisation device which is free from the above-
5 mentioned problems associated with the use of traditional wheel clamp devices.

According to a first aspect of the present invention there is provided a vehicle immobilisation device for securing to a vehicle windscreen, comprising
10 screening means which, when the device is in an in-use disposition on the vehicle windscreen, serves to impair a driver's view through the windscreen; suction grip means for holding said screening means in said in-use disposition on said windscreen by suction; releasing
15 means for enabling release of the suction of said suction grip means so as to allow removal of the device from the windscreen; and security means for preventing unauthorised operation of said releasing means.

According to a second aspect of the present
20 invention there is provided a method for securing a vehicle immobilisation device of the first aspect of the present invention to a vehicle windscreen, comprising the steps of: arranging said screening means on the vehicle windscreen in said in-use disposition so
25 as to impair a driver's view through the windscreen; activating said suction grip means so as to hold said screening means in said in-use disposition on said windscreen; and activating said security means so as to prevent unauthorised operation of said releasing means.

30 According to a third aspect of the present invention there is provided a method for removing a vehicle immobilisation device secured to a vehicle windscreen by a method of the second aspect of the present invention, comprising the steps of: de-
35 activating said security means so as to enable operation of said releasing means; operating said

releasing means to deactivate said suction grip means; and removing the vehicle immobilisation device from the vehicle windscreen.

Reference will now be made, by way of example, to 5 the accompanying drawings, in which:

Figure 1 is a front view of a vehicle to which a vehicle immobilisation device according to a first embodiment of the present invention has been secured;

Figure 2 is a side view of the vehicle of Figure 10- 1;

Figure 3 is a side view of the first embodiment of the present invention shown in an open state;

Figure 4 is a plan view showing the first embodiment of the present invention in an open state;

Figure 5 is a plan view showing parts of Figure 4 in more detail;

Figure 6 is a schematic diagram for use in explaining the size and positioning of an embodiment of the present invention;

Figure 7 shows a variation of the first embodiment of the present invention having more than one suction grip;

Figure 8A is a plan view of a vehicle immobilisation device according to a second embodiment 25 of the present invention; and

Figure 8B is a side view of part of the second embodiment of the present invention.

Figure 1 shows a vehicle immobilisation device 1 according to a first embodiment of the present 30 invention secured to the exterior of the windscreen 28 of a vehicle 26, and Figure 2 is a side view of the same vehicle 26 showing the vehicle immobilisation device 1 secured to the vehicle windscreen 28. The vehicle immobilisation device 1 of the first embodiment 35 is accompanied by an adhesive sticker 30 fixed onto the front windscreen 28 warning the driver of the vehicle

that no attempt should be made to move the vehicle 26 or remove the vehicle immobilisation device 1.

The vehicle immobilisation device 1 of the first embodiment of the present invention will now be 5 described in more detail with reference to Figures 3 to 5. The vehicle immobilisation device 1 comprises a housing member 16 incorporating a suction grip 2, as well as first, second and third strut members 8, 10 and 12 respectively serving to secure said suction grip 10 within the housing member 16. The suction grip 2 can be secured in a pivotal manner within the housing member 16, e.g. by use of a ball and socket arrangement, so as to provide the device with extra 15 flexibility to cope with windscreen curvature.

15 The suction grip 2 is formed in this embodiment as a flexible rubber suction cup (such suction grips are commonly used in the glazing industry for the moving of panes of glass), the open end of which projects a small distance through a cut-out 3 in the lower face of the 20 housing member 16. An annular protective layer 4 of high density foam is formed on the lower face of the housing member 16 around the protruding suction grip 2, the thickness of the protective layer 4 being substantially the same as the protrusion distance of 25 the suction grip 2.

Further incorporated within the housing member 16 is a pump handle 14 which is connected operatively to a suction device (not shown) which is operated in use to suck air from within the suction grip 2. As shown in 30 Figure 5, the pump handle 14 is fixed to the strut members 8, 10 and 12 by fixing members 15. The strut members 8, 10 and 12 are fixed to the housing member 16 by a fixing member 24 secured to the inside of the housing member 16. A releasing mechanism (not shown) 35 is further provided within the housing member 16 which

when operated allows air to be re-introduced into the suction grip 2, thereby releasing the suction.

A covering member 18 of the vehicle immobilisation device 1 is hinged to the housing member 16 by a hinge

5 22. The dotted outline of the covering member 18 in Figure 3 shows the vehicle immobilisation device 1 of the present embodiment in a fully open state, while the solid-line outline of the covering member 18 shows the vehicle immobilisation device 1 in a partially open

10 state. A retaining strut 20 is provided to retain the covering member 18 in the partially open state. A security (or locking) mechanism 6b is provided on the covering member 18 which engages with a corresponding security mechanism 6a provided on the housing member 16

15 when the covering member 18 is rotated to a fully closed position. When the covering member is in the closed position, the security mechanism 6a, 6b prevents unauthorised access to and operation of the components held within the housing member 16.

20 The operation and deployment of the vehicle immobilisation device 1 will now be described. The vehicle immobilisation device 1 is firstly positioned on the exterior of the windscreen 28 as shown in Figure 1 with the suction grip 2 and protective layer 4 making

25 contact with the windscreen 28. The vehicle immobilisation device 1 of the first embodiment forms a continuous opaque screen member which, when in an in-use disposition on the windscreen 28 of the vehicle 26, serves to impair the view through the windscreen of a

30 driver of the vehicle, so as to make it impossible to drive the vehicle away in a safe and legal manner. The ideal positioning and size of the screen member will be described below with reference to Figure 6.

Once in position on the windscreen 28, the

35 covering member 18 is swung open and retained in a partially open position by use of the retaining strut

20. Use of such a retaining strut 20 is beneficial since it prevents the covering member 18 moving to a fully open position where it might make contact with and potentially damage the surface of the vehicle 26 on 5 which the vehicle immobilisation device 1 is being secured. Likewise, the high density foam layer 4 protects the vehicle 26 and the windscreen 28 from being scratched as the vehicle immobilisation device 1 is being fitted.

10 When the vehicle immobilisation device 1 is in a suitable position on the vehicle windscreen 28, the pump handle 14 is operated by the operative to pump air out of the suction grip 2 thereby to create a partial vacuum within the interior of the suction grip 2. The 15 retaining strut 20 is then released and the covering member 18 is swung down to the fully closed position. The security mechanism 6a, 6b is activated to lock the vehicle immobilisation device 1 closed so that unauthorised access and operation of the components 20 within the housing member, in particular the releasing mechanism, is prevented. A warning sticker 30 is then adhered to the vehicle windscreen 28 informing the driver of the action he should take to have the device removed and warning him that attempting to drive the 25 vehicle with the device in place would be an offence, as would an unauthorised attempt to remove the device in any way. The vehicle 26 is thus rendered substantially immobile. The adhesion created by the suction grip 2 is of such a strength as to make the 30 forceful removal of the vehicle immobilisation device from the vehicle windscreen almost impossible; such an attempt to remove the device would anyway be illegal.

The vehicle immobilisation device 1 is removed from the vehicle windscreen 28 by first deactivating 35 the security mechanism 6a, 6b, opening the covering member 18 to the partially opened state by use of the

retaining strut 20, and then operating the releasing mechanism (not shown) to release the partial vacuum from the suction grip 2. The vehicle immobilisation device 1 can then be removed from the vehicle
5 windscreen 28 and stowed away for subsequent re-application.

When the vehicle immobilisation device 1 is in an armed state and secured to the vehicle windscreen 28, it sits flush to the windscreen 28 with the high-density foam protective layer 4 in contact with the windscreen 28 and the suction grip 2 holding the device 1 in tight contact with the windscreen 28. The size of the gap between the housing member 16 and the windscreen 28 is preferably of the order of
10 millimetres, with the gap being filled by the high density foam protective layer 4. The small size of the gap makes the prising-off of the vehicle immobilisation device 1 or the use of other invasive methods of removal more difficult. In the present embodiment the high density foam protective layer 4 not only serves to prevent scratches and the like to the vehicle windscreen 28 but it also serves as a suction grip protection mechanism to prevent insertion of a piercing instrument or the like which may be used in an attempt
15 to pierce the suction grip 2. Use of a toughened rubber compound for the suction grip is also beneficial to make piercing more difficult should this be attempted.
20
25

As shown in Figure 2, the vehicle immobilisation device 1 assumes a substantially flat profile on the vehicle windscreen 28. The lateral dimensions of the vehicle immobilisation device 1 are determined by the basic requirement that the vehicle immobilisation device must serve its purpose of impairing the forward visibility of a driver of the vehicle to which the device is secured to such an extent as to render the
30
35

vehicle dangerous and illegal to drive. A very wide screening member will provide good vision impairment but may result in a vehicle immobilisation device which is too large or bulky for ease of use, while a narrower 5 screening member will result in a more lightweight device but will provide less vision impairment.

Figure 6 is a schematic diagram showing the relative positions of the vehicle immobilisation device 1, the driver's eye 45 and the driver's view of the 10 road 40 ahead. For the purpose of this illustration, it is assumed that the vehicle immobilisation device 1 is square-shaped. The vehicle immobilisation device 1 is preferably positioned on the vehicle windscreen 28 such that the centre of the vehicle immobilisation 15 device 1 is directly in the usual line of sight from the driver's eye 45 to the road 40 lying ahead of the driver.

The distance d between the driver 45 and the windscreen 28 on which the vehicle immobilisation 20 device 1 is secured will vary from vehicle to vehicle and from driver to driver, but an estimate of the maximum distance d will serve as a useful guide for the selection of appropriate width $2w$ for the vehicle immobilisation device 1 (the distance is limited by the 25 reach of the driver to the steering wheel). One parameter by which to measure the degree of vision impairment provided by the vehicle immobilisation device 1 is the angle θ shown in Figure 6. The greater the value of θ , the more impairment of the driver's 30 view through the windscreen is provided. For effective impairment, the value of θ is preferably more than 5° , and more preferably greater than 10° , and more preferably greater than 15° . The width $2w$ of the vehicle immobilisation device 1 is then calculated from 35 the chosen value of θ according to the following formula: $w = d \tan \theta$.

Although the first embodiment has been described as having a single suction grip 2 located substantially in the centre of the vehicle immobilisation device 1, it will be appreciated that a greater number of suction 5 grips can be provided and placed at various positions on the vehicle immobilisation device. For example, Figure 7 shows a vehicle immobilisation device 1a that comprises four separate suction grips 2a located towards the four corners of the vehicle immobilisation 10 device 1a. Although it is preferable for the high density foam protective layer to cover substantially the entire lower surface of the housing member 16, this is by no means essential. For example, in the vehicle immobilisation device 1a of Figure 7 the foam 15 protective layer 4 is confined to the vicinity around the suction grips 2a as shown by the dotted lines in Figure 7. Such a foam layer 4a is still able to provide protection against scratches and the like, and it still serves the purpose of hindering access of an 20 invasive device to the suction grips 2a.

The first embodiment is described above as being provided with its own means for producing the required partial vacuum in the suction grip 2 by way of a pump handle 14 operating a suction device (not shown). It 25 will be appreciated that it is not necessary to provide a vehicle immobilisation device embodying the invention with its own means for producing a partial vacuum, but instead it would be possible to provide suitable means for connecting the suction grip to an external suction 30 device. The operative would simply attach the external suction device to the vehicle immobilisation device when required in order to create the partial vacuum in the suction grip.

In the above first embodiment, the covering member 35 18 serves as the primary screening member that serves to impair the driver's forward visibility, although

clearly other parts of the vehicle immobilisation device also serve the function of screening, in some degree or another, the view of the road ahead from the driver. For example, the housing member 16 and the 5 suction grip 2 are both opaque in this embodiment and therefore act to impair the driver's vision. However, it is the covering member 18 in the first embodiment that is principally intended to function as the screening member.

10 In contrast to the first embodiment in which the principal screening member is constructed as a single entity, a second embodiment will now be described with reference to Figures 8A and 8B, in which the screening member comprises a plurality of separate sections.

15 Figure 8A is a plan view showing a vehicle immobilisation device 1b according to a second embodiment of the present invention. The vehicle immobilisation device 1b comprises three separate screen portions 11-1, 11-2 and 11-3. The vehicle 20 immobilisation device 1b of the second embodiment comprises four suction grips 2b, two of which are located on the first screen portion 11-1 and the other two of which are located on the third screen portion 11-3. A security device is provided for each of the 25 suction grips 2b, comprising a security lid 18b connected by a hinge 22b to the appropriate screen portion 11-1 or 11-3, the lid 18b being secured by means of a locking mechanism 66. The first screen portion 11-1 is hinged to the second screen portion 11- 30 2 which itself is hinged to the third screen portion 11-3 by use of hinges 50.

Figure 8B is a side view showing in more detail the construction of one of the suction elements of the vehicle immobilisation device 1B. As in the first 35 embodiment, a protective layer 4b is arranged around each suction grip 2b. It will be appreciated that the

provision of such a protection layer is preferable but not essential. The locking mechanism 66 shown in Figure 8A is shown in Figure 8B to comprise a first locking element 66b provided on the security lid which 5 engages with a second locking element 66a provided on the screen member concerned (11-3 in Figure 8B).

In order to save space, in the second embodiment, each suction grip 2b is not provided with its own suction device and pump handle as in the first 10 embodiment. Instead, a pump connection mechanism 70 is provided which enables the suction grip 2b to be connected to an external pump device at the time of securing the device 1b to the vehicle windscreen. After the suction grip 2b has been activated so as to 15 provide a grip on the windscreen, the external pump device is removed from the connection mechanism, the securing lid 18b is closed, and the locking mechanism 66 is activated to prevent unauthorised removal of the device 1b.

20 Removal of the vehicle immobilisation device 1b of the second embodiment is achieved by deactivating the locking mechanisms 66 in turn, opening each of the security lids 18b, and operating the releasing means so as to deactivate the suction grips. Once removed, the 25 vehicle immobilisation device 1b can be folded or rolled up for compact storage. Other arrangements of screen portions and associated folding mechanisms will be readily apparent to the person skilled in the art.

It will be appreciated that the security lids 18b 30 of the second embodiment need not be hinged to one of the screen portions 11-1 to 11-3. Instead a security lid may be in the form of a removable cap, preferably secured to the vehicle immobilisation device by a securing wire or the like so as to prevent the loss 35 thereof.

Although the principal use of a vehicle immobilisation device embodying the present invention has been suggested as being an alternative to a traditional wheel clamp device for dealing with 5 illegally parked vehicles, it will be appreciated that such a device embodying the present invention will find an application in any situation where the removal of a vehicle is to be prevented. For example an embodiment of the present invention can be used as a vehicle 10 security device to prevent theft of the vehicle to which it is secured.

CLAIMS:

1. A vehicle immobilisation device for securing to a vehicle windscreen, comprising:

5 screening means which, when the device is in an in-use disposition on the vehicle windscreen, serves to impair a driver's view through the windscreen;

10 suction grip means for holding said screening means in said in-use disposition on said windscreen by suction;

releasing means for enabling release of the suction of said suction grip means so as to allow removal of the device from the windscreen; and

15 security means for preventing unauthorised operation of said releasing means.

2. A vehicle immobilisation device as claimed in claim 1, further comprising suction means for producing the suction in said suction grip means.

20 3. A vehicle immobilisation device as claimed in claim 2, wherein said suction means are operable manually by the user of the device to produce the suction in said suction grip means.

25 4. A vehicle immobilisation device as claimed in claim 3, further comprising a pump handle that is operated by said user to produce the suction.

30 5. A vehicle immobilisation device as claimed in claim 4, wherein said pump handle is formed and arranged so as to serve also as a grip handle for lifting and carrying the vehicle immobilisation device.

6. A vehicle immobilisation device as claimed in any preceding claim, comprising housing means for housing said releasing means, and covering means moveable between an open position allowing access to said

5 releasing means and a closed position preventing access to said releasing means, said security means serving to lock said covering means in said closed position.

10 7. A vehicle immobilisation device as claimed in claim 6, wherein said covering means comprise a hinged lid.

15 8. A vehicle immobilisation device as claimed in claim 6 or 7, wherein said covering means also act as said screening means.

9. A vehicle immobilisation device as claimed in any preceding claim, wherein said suction grip means comprise a plurality of suction grips.

20 10. A vehicle immobilisation device as claimed in claim 9, when read as appended to claim 6, wherein covering means and security means are provided separately for each of said plurality of suction grips.

25 11. A vehicle immobilisation device as claimed in any preceding claim, further comprising a protective layer arranged to cushion the vehicle windscreen from contact with the device during fitting and when in said in-use disposition on said vehicle windscreen.

30 12. A vehicle immobilisation device as claimed in claim 11, wherein said protective layer is formed of high density foam.

13. A vehicle immobilisation device as claimed in any preceding claim, comprising suction grip protection means for preventing access to said suction grip means from the under-side of the device facing the windscreen 5 when in said in-use disposition.

14. A vehicle immobilisation device as claimed in claim 13, when read as appended to claim 11, wherein said protective layer is arranged around said suction 10 grip means so as to serve as said suction grip protection means.

15. A vehicle immobilisation device as claimed in any preceding claim, wherein said device is arranged to sit 15 flush to said vehicle windscreen when in said in-use disposition.

16. A vehicle immobilisation device as claimed in any preceding claim, wherein parts of the device visible 20 from the exterior of the vehicle when the device is in said in-use disposition are decorated in a highly visible finish.

17. A vehicle immobilisation device as claimed in claim 16, wherein said highly visible finish is a 25 reflective finish.

18. A vehicle immobilisation device as claimed in any preceding claim, wherein said screening means comprise 30 a plurality of screen portions.

19. A vehicle immobilisation device as claimed in claim 18, wherein said screen portions are arranged and connected so as to be foldable or operable to be rolled 35 up.

20. A vehicle immobilisation device as claimed in any preceding claim; where said suction grip means comprise one or more suction cups.

5 21. A vehicle immobilisation device as claimed in any preceding claim; wherein the device assumes a substantially flat profile when in said in-use disposition.

10 22. A vehicle immobilisation device as claimed in any preceding claim, wherein the width of the device is of the order of $2d \tan \theta$, where d is an estimate of the distance from the driver's eye to the vehicle windscreen, and θ is greater than 5° .

15 23. A vehicle immobilisation device as claimed in claim 22, wherein θ is greater than 10° .

20 24. A vehicle immobilisation device as claimed in claim 23, wherein θ is greater than 15° .

25 25. A method for securing a vehicle immobilisation device as claimed in any preceding claim to a vehicle windscreen, comprising the steps of:
arranging said screening means on the vehicle windscreen in said in-use disposition so as to impair a driver's view through the windscreen;
activating said suction grip means so as to hold said screening means in said in-use disposition on said windscreen; and
activating said security means so as to prevent unauthorised operation of said releasing means.

30 26. A method as claimed in claim 25, wherein said screening means are arranged on said vehicle windscreen

such that the centre of the screening means is substantially in the driver's line of vision.

27. A method as claimed in claim 25 or 26, wherein the
5 vehicle immobilisation device is placed on the exterior
of the vehicle windscreen.

28. A method as claimed in claims 25, 26 or 27,
further comprising the step of applying an information
10 sticker to the windscreen.

29. A method for removing a vehicle immobilisation
device secured to a vehicle windscreen by a method as
claimed in any one of claims 25 to 28, comprising the
15 steps of:

de-activating said security means so as to enable
operation of said releasing means;

operating said releasing means to deactivate said
suction grip means; and

20 removing the vehicle immobilisation device from
the vehicle windscreen.

30. A method of preventing a vehicle from being driven
away, comprising:

25 employing suction grip means to attach a screening
means by suction to the vehicle windscreen so that the
screening means impair a driver's view through the
windscreen; and

30 securing the suction grip means against release of
the suction so as to prevent unauthorised removal of
the screening means from the windscreen.

35. A vehicle immobilisation device substantially as
hereinbefore described with reference to the
accompanying drawings.

32. A method for securing a vehicle immobilisation device substantially as hereinbefore described with reference to the accompanying drawings.

5 33. A method for removing a vehicle immobilisation device substantially as hereinbefore described with reference to the accompanying drawings.

10 34. A method of preventing a vehicle from being driven away substantially as hereinbefore described with reference to the accompanying drawings.

ABSTRACTVEHICLE IMMOBILISATION DEVICE

A vehicle immobilisation device is provided for
5 securing to a vehicle windscreen, comprising screening
means (18) which, when the device is in an in-use
disposition on the vehicle windscreen, serves to impair
a driver's view through the windscreen; suction grip
means (2) for holding said screening means (18) in said
10 in-use disposition on said windscreen by suction;
releasing means (not shown) for enabling release of the
suction of said suction grip means (2) so as to allow
removal of the device from the windscreen; and security
means (6a, 6b) for preventing unauthorised operation of
15 said releasing means.

[Fig. 3]

FIG. 1

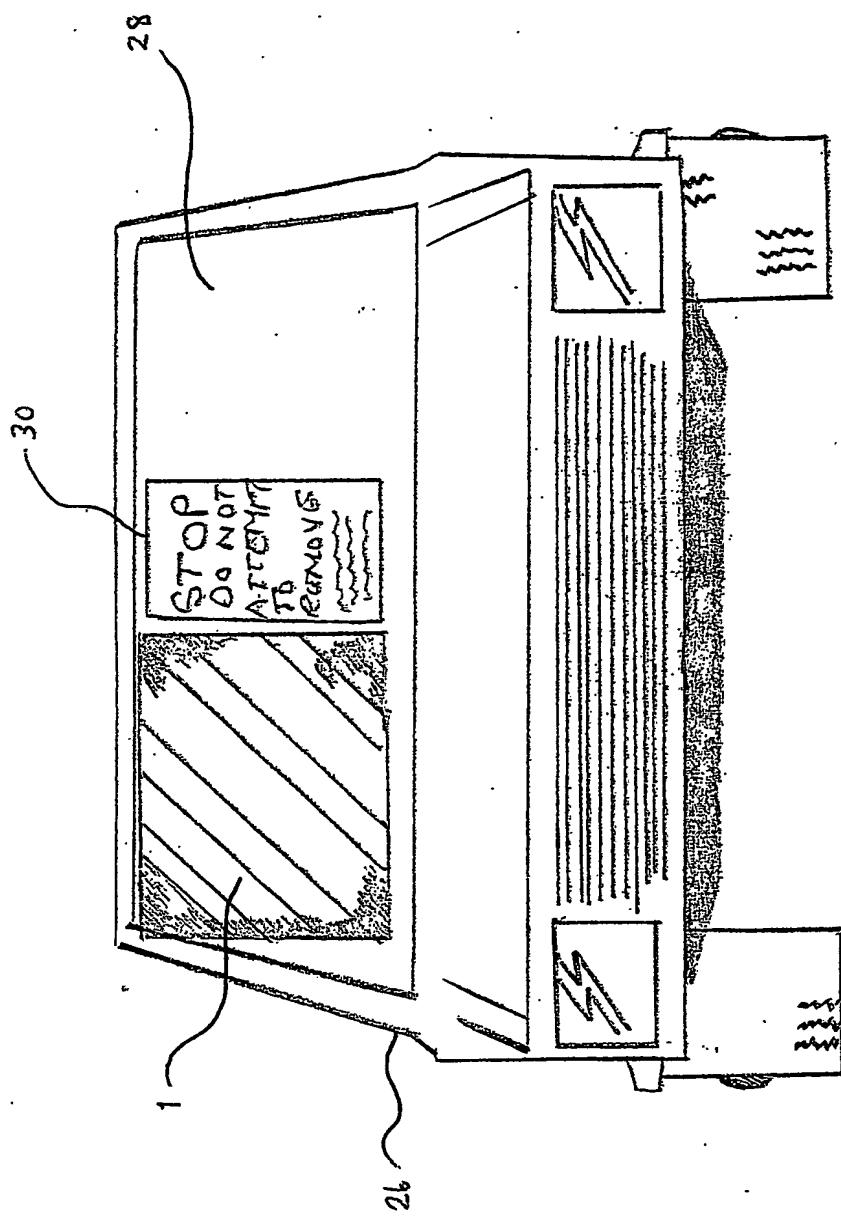


FIG. 2

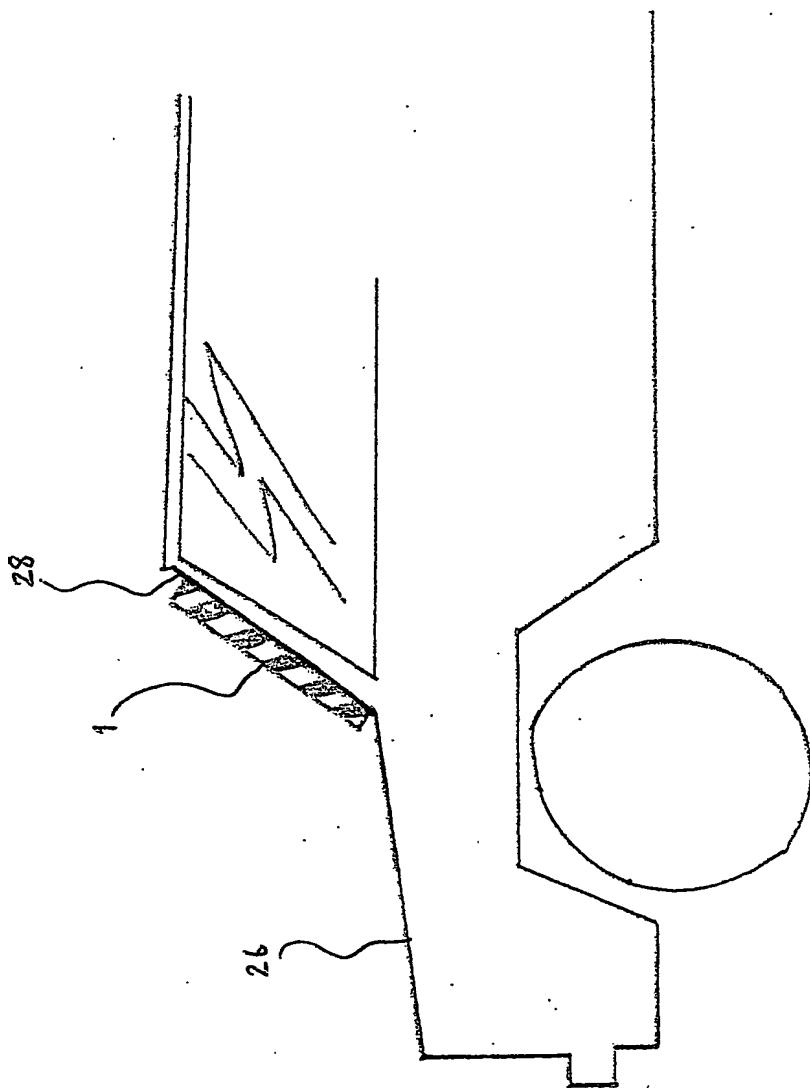
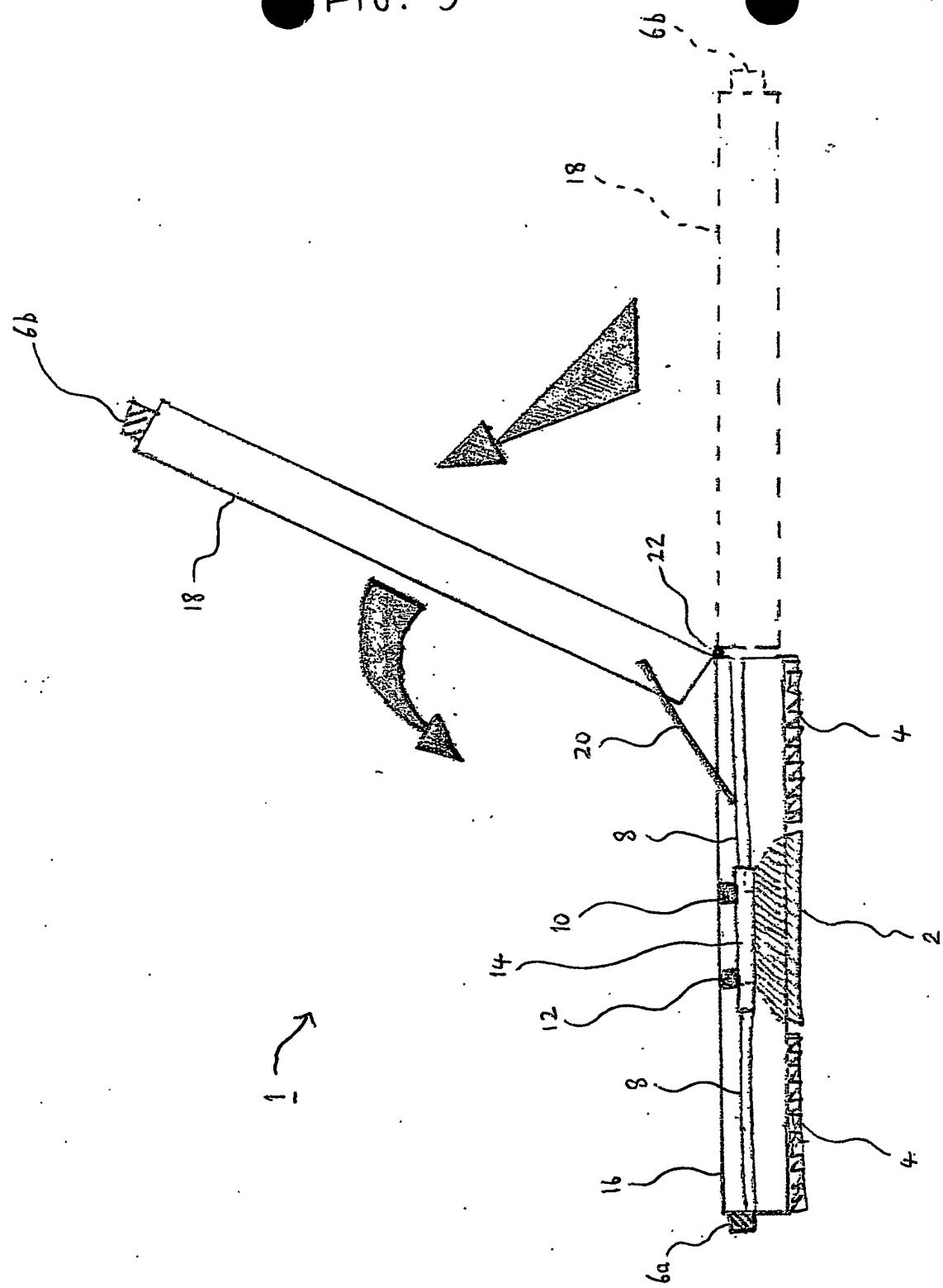
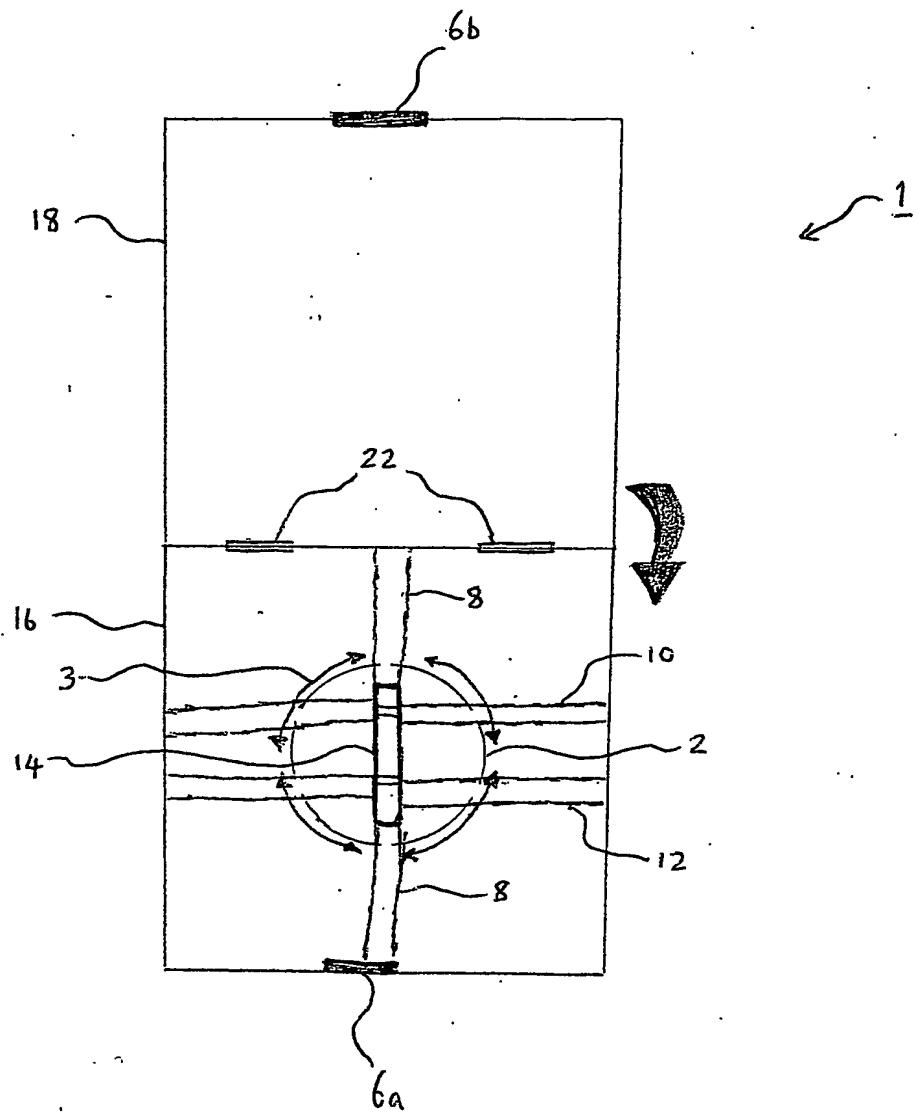


FIG. 3

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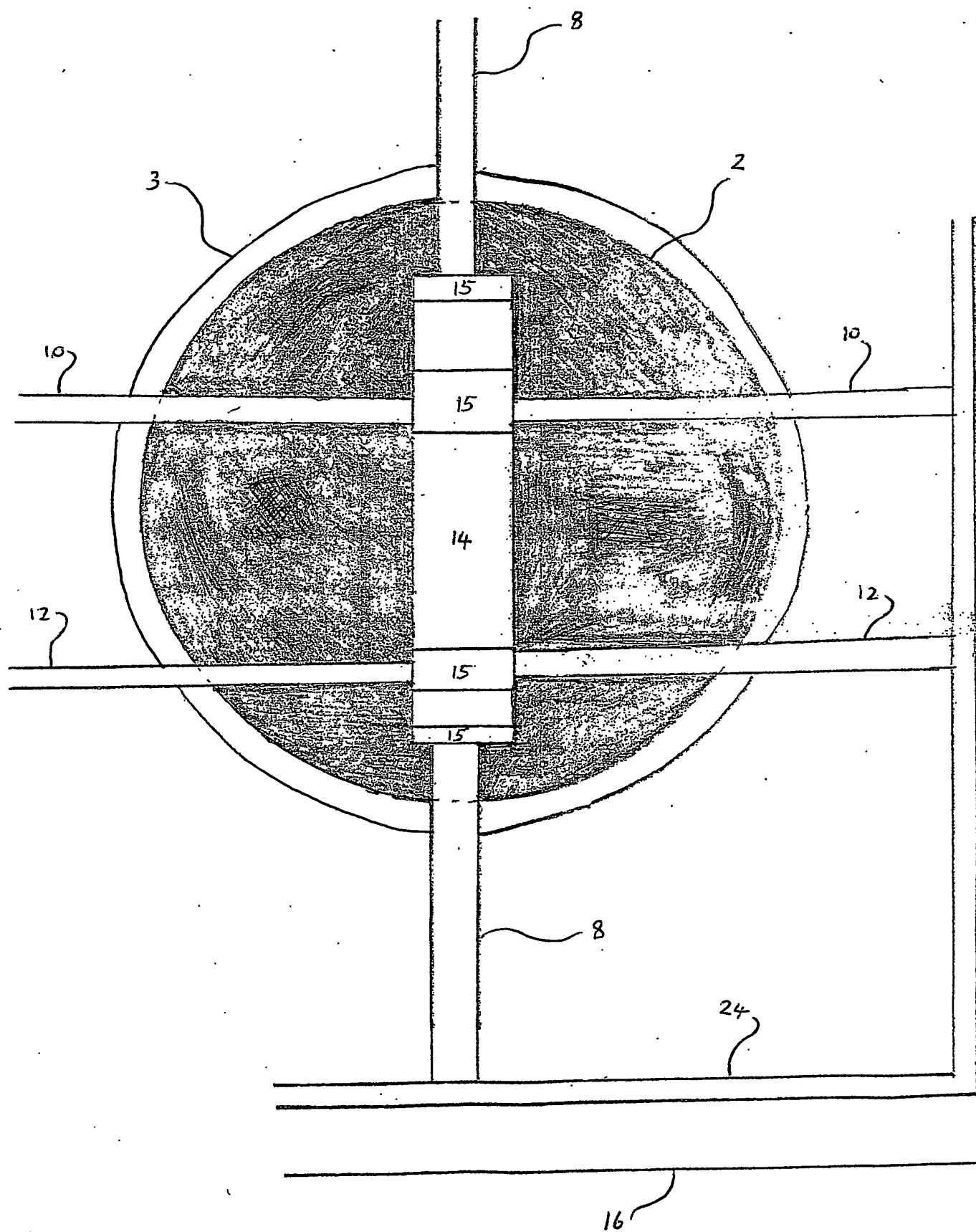


4/8
FIG. 4



58

FIG. 5



6/8
FIG. 6

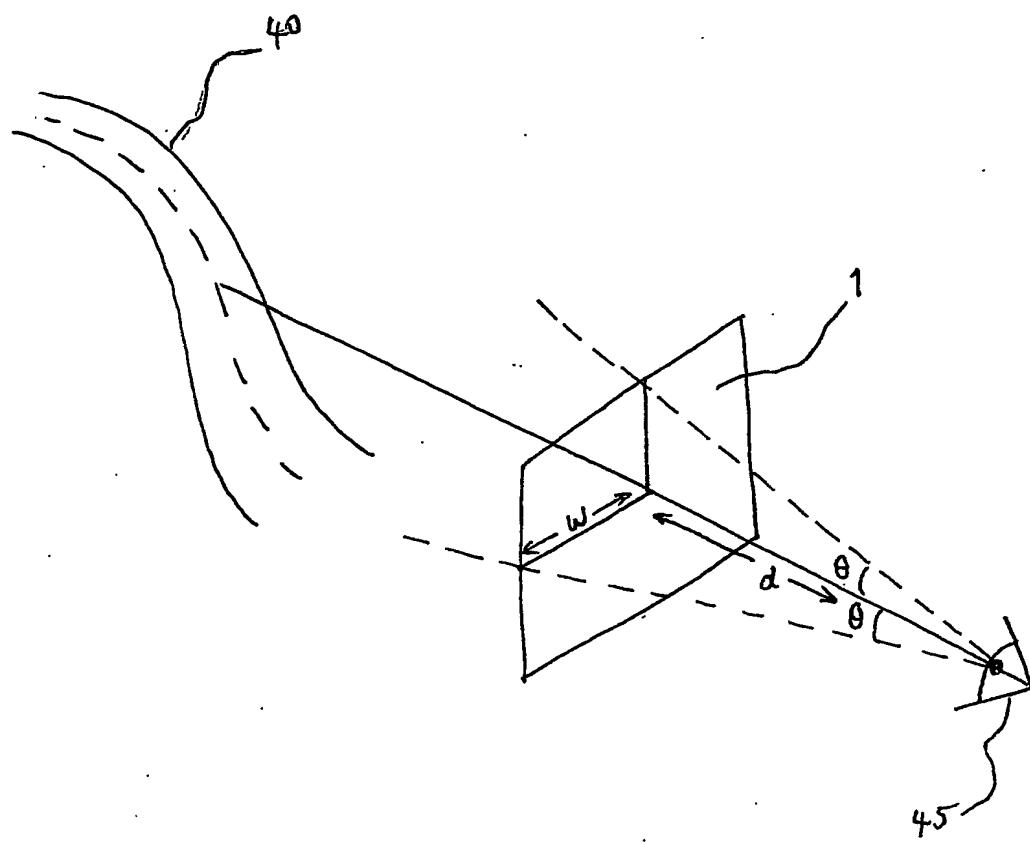


FIG. 7

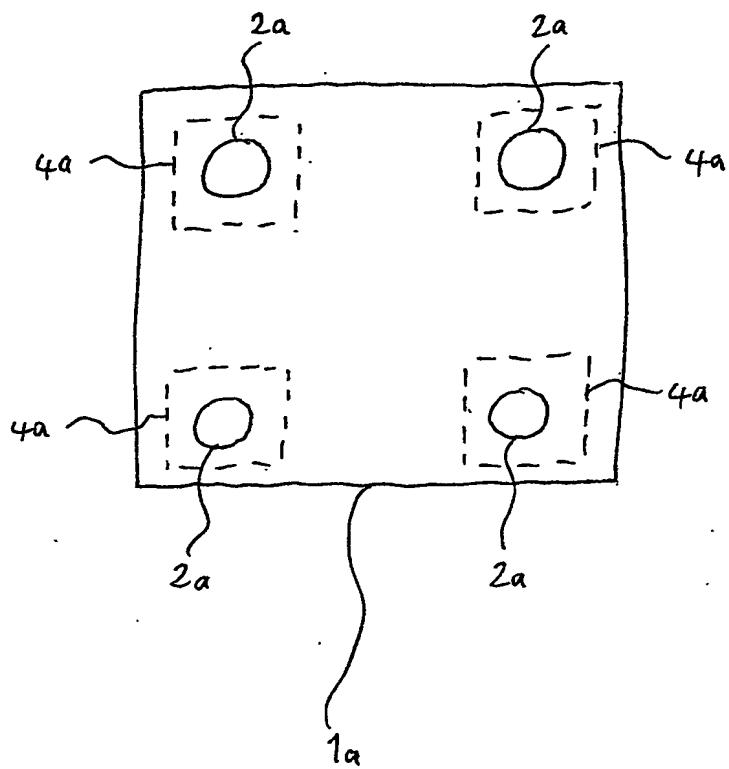


FIG. 8A

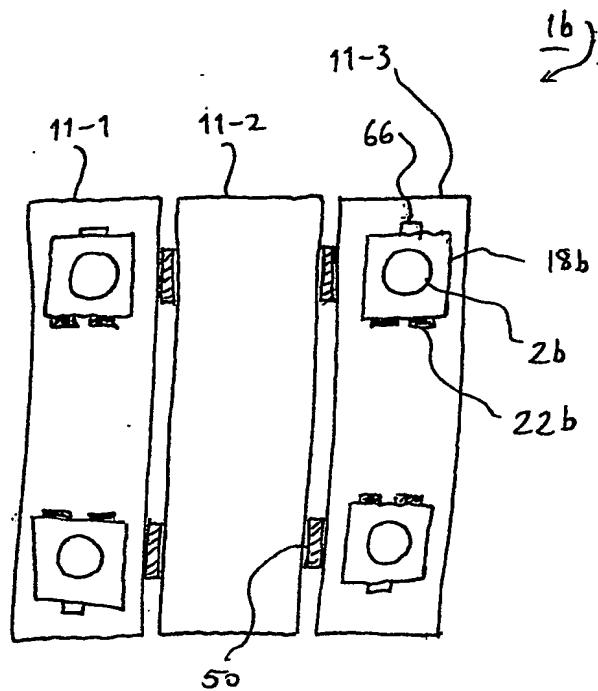
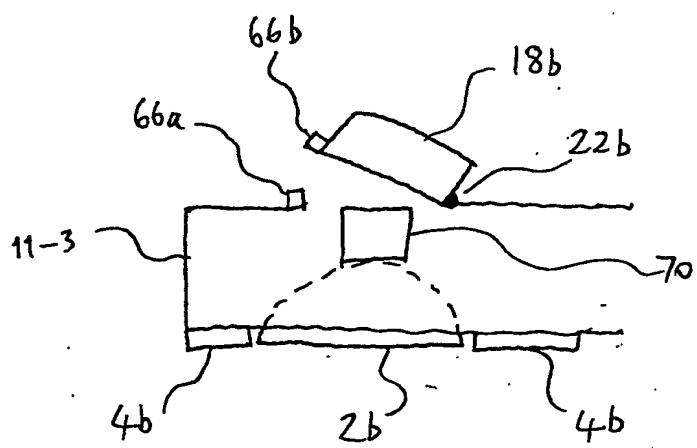


FIG. 8B



PCT Application

GB0304952

